do with the excitation. When the animal was placed with its head 25 mm. from the center of rotation it required no greater rate of rotation to act as a stimulus than when the head was 300 mm. from the center. The centrifugal force in the latter position is 12 times as great as in the former, but the angular velocity and hence the torsion effect was the same in the two positions.

Convection currents due to a difference in temperature on the two sides of the vestibule could much more conceivably occur in the liquid of the vestibule than in the canals. The nystagmus movements described by Högyes as a result of irrigating the external ear of man and many animals with hot or cold water and the change of character of the nystagmus by change of position of the head can best be accounted for by the changes of density of the liquid in the vestibule. The reliability of Bárány's use of these phenomena for diagnostic purposes is not affected by the acceptance of this view, but only his unscientific explanation must be abandoned.

I wish in closing to draw attention to the fact that a survey of all the experimental work on the labyrinth leads to the conclusion that the stimulation of the vestibular structures and of the sensory endings in the ampullæ depend upon the same principle, namely the effects of changes of relative tensions. How the change of tension excites the nerve endings and what part if any the hair cells play in the process still remains wholly outside the field of experimental investigation.

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MEETING OF THE GENETICISTS INTERESTED IN AGRICULTURE

IN conjunction with the meetings of the American Association for the Advancement of Science and affiliated societies in Chicago an informal gathering of instructors and investigators of genetics related to agriculture was held December 28th at the University of Chicago. Some thirty-five representatives from fifteen Agricultural Colleges and Experiment Stations, the United States Department of Agriculture and other institutions were present. Unfortunately the impossibility of getting the final notices out until very late prevented a number of others from attending. The purpose of the meeting was to discuss such topics of mutual interest at this time as

departmental organization, the place of genetics in the curriculum in agricultural colleges and cooperation in genetic investigations.

In order to open up the subject and start the discussion the above topics were assigned in advance by Professor L. J. Cole, of Wisconsin, who was largely instrumental in bringing about the meeting. In the carrying out of this plan Professors J. A. Detlefsen, Illinois, and R. A. Emerson, Cornell, spoke on organization. In their talks and the discussion which followed it was shown that in many institutions the instruction and research in genetics are scattered about in many different departments with no one person or department responsible for a fundamental course in genetics. In other institutions some genetics is taught in all departments with the emphasis laid in some one department, while in other institutions a separate department of genetics has been established which assumes all responsibility for genetics although other departments may give some special courses and carry on particular lines of research where the staff is interested and well fitted to do such work. All were agreed that a fundamental, general course of genetics should be required before taking up any applied courses in breeding, but in what department that course should be given is a secondary matter to be determined by existing conditions. Many thought it to be desirable for the teaching staff to keep in touch with applied problems of genetics by carrying on investigations of a practical nature although it would be unwise to limit either the theoretical or applied research to a single department of genetics as the outcome of such experiments depends so largely on familiarity with the material worked with and individual interest in particular problems.

In order to bring the general conclusions to the attention of the authorities of the agricultural colleges and experiment stations a committee was appointed to draw up a statement which would embody in a general way the consensus of opinion of this meeting in regard to the matter of departmental organizations. The following resolution was prepared and adopted:

> As far as consistent with present organization in agricultural colleges a single department of genetics, prepared to handle the elementary and advanced courses of general genetics and to direct the investigational work on the basic principles of genetics, has certain practical advantages in that such an arrangement: (1) simplifies administration and prevents unnecessary duplication; (2) identifies and gives standing to the subject of genetics in the curriculum; and (3) unifies instruction and research. Such a department should not attempt to control all the investigational work in specialized subjects on either the applied or theoretical problems of genetics but would be able to cooperate in every way possible to advance the outcome of such investigations.

The place of genetics in the agricultural curriculum was discussed by Professors E. B. Babcock, California, and S. A. Beach, Iowa. In their presentations and in the discussion which followed it was stated that it is theoretically desirable that a general course in genetics should be required of all students of agriculture but that in practise it is not always possible to do this. Most institutions require genetics of students taking certain courses, particularly those concerned directly with plant and animal production. In other institutions genetics is optional with the student or left to the student advisers. Laboratory work is not always required except of those students who intend to specialize in genetics. A general course in genetics should come as early in the curriculum as possible, usually in the second or third year, and should follow an elementary course in biology or its equivalent and precede any of the courses in applied genetics. This would seem to be self-evident but as now practised this is not always the case. There should, furthermore, be only one such elementary course, in whatever department given, which should treat of the general principles and lay the foundation for further application to special subjects.

The subject of cooperation in genetic investigation was discussed by Professor M. J.

Dorsey, Minnesota, who emphasized the close relationship of genetic investigations on applied problems with other sciences, cooperation being particularly necessary to secure the greatest results. All who entered the discussion of this topic thought that cooperation should not go on so far as to attempt to direct another's research and that the success of any cooperation of this kind is limited by the mutual confidence of the workers.

At the close of the meeting it was agreed that no permanent organization should be formed but that informal meetings such as this should be arranged for whenever desirable. Professor L. J. Cole, who was elected chairman of the meeting, was voted to act as secretary *ad interim*. D. F. JONES,

Secretary pro tem.

NATIONAL PARKS[1]

WHILE a small number of scientific societies were represented, the conference was well attended, especially by those interested in natural parks for recreation purposes. Their aim is to secure more parks and protect existing ones. Very few of the existing parks and preserves are free from liability to extensive modification through recreation activities, scientific forestry, fires, or exploitation. Even the National Parks must be watched and defended against external aggression. There are now only a few areas aside from the National Parks which have been set aside with the intention that they should be left in a natural state. Most areas have been and probably will continue to be set aside primarily as recreation parks, or as forest preserves. The main business of those interested in areas to be held in an original state, must of necessity be to get areas set aside within these forest preserves and parks.

The following was made evident by the conference.

1. That the forces interested in the establishment of natural parks and forest preserves for recreation purposes—to make "better citizens through contact with nature" are well organized, and are probably the strongest force operating to secure more parks and protect existing ones.

2. Science has left them quite uninformed of its needs for natural areas and of the practical significance of scientific results which may accrue from study of natural areas. They welcome the idea of biological study as a further argument for natural tracts.

3. They are, however, without constructive plans of management of the smaller tracts which will insure them against destruction from over use as recreation parks. Such plans of management must be based on knowledge of plant and animal ecology which they do not possess.

4. They are engaged in drafting legislation and in advising legislators without the counsel of those interested in preserves for research purposes.

5. It is incumbent upon scientific societies, museums, and universities to organize and to provide funds which will serve the following purposes: (*a*) to place information as to the scientific uses, and scientific management of natural areas, into the hands of those individuals and organizations working for the preservation of natural conditions; (*b*) to make possible the representation of scientific needs before legislative bodies and officials; (*c*) to provide for furthering the wise selection of new areas, and (*d*) to make existing areas accessible to scientists by the publication of lists and guide books.

V. E. SHELFORD

[1] Report of the delegate of the American Society of Zoologists to the National Conference on Parks, Des Moines, Iowa, January 10–12, 1921. This report will be submitted to the American Society of Zoologists at their next annual meeting. —W. C. ALLEE, *Secretary-Treasurer.*

SCIENTIFIC EVENTS

WORLD PRODUCTION OF COAL IN 1920

REPORTS received by the United States Geological Survey indicate that the total output in 1920 was about 1,300,000,000 metric tons. This, although a great increase over 1919, was still 42,000,000 tons short of the output in 1913, the last year before the Great War. The